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**From:** Watkins, Tim [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=4CBD1C572F584FD7B0A3B5945F118558-WATKINS, TIM]  
**Sent:** 1/2/2020 8:58:04 PM  
**To:** Washington, John [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=fdc3e8ce9f1d45c4894881ff420ca104-Washington, John]  
**CC:** Gillespie, Andrew [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dce99ece87694a06b3009d7756e2a89e-Gillespie, Andrew]; Stevens, Caroline [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=dfd9eb36db0a44eaa6cabf85f3cf0550-Stevens, Caroline]; Schumacher, Brian [/o=ExchangeLabs/ou=Exchange Administrative Group (FYDIBOHF23SPDLT)/cn=Recipients/cn=c2d457e4a6684028801b188422df52a7-Schumacher, Brian]  
**Subject:** FW: ORD Advanced Notification: Manuscript: Washington et al., Nontargeted mas-spectral discovery of novel PFAS & their use to fingerprint legacy PFAS in New Jersey  
**Attachments:** 190926 NJ PFAS Washington fact sheet-NA Comments.docx; 191104 WashingtonEtAlSuppMatPostReviewChangesAccepted - NA Comments.docx; 191115 WashingtonEtAlManuscriptPostReviewsThruFileNameDate - NA comments.docx

Hi John –

Hope you enjoyed your time out of the office over the Holidays.

Please see the attached documents (manuscript, supplemental material, and fact sheet) with comments from EPA Region 2 (Nidal Azzam). I took a quick look and they do not look to extensive or difficult to address and/or consider.

Thanks.

Tim Watkins  
Director  
Center for Environmental Measurement and Modeling  
Office of Research and Development, USEPA

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Ex. 6 Personal Privacy (PP)

*“Protecting human health and the environment by delivering innovative measurement and modeling solutions to EPA and our partners.”*

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**From:** Frithsen, Jeff <Frithsen.Jeff@epa.gov>  
**Sent:** Sunday, December 22, 2019 8:15 AM  
**To:** Gillespie, Andrew <Gillespie.Andrew@epa.gov>; Watkins, Tim <Watkins.Tim@epa.gov>  
**Cc:** Fleming, Megan <Fleming.Megan@epa.gov>  
**Subject:** FW: ORD Advanced Notification: Manuscript: Washington et al., Nontargeted mas-spectral discovery of novel PFAS & their use to fingerprint legacy PFAS in New Jersey

Sharing – comments on the Washington et al. manuscript from Region 2.

Jeff

Jeffrey B. Frithsen, Ph.D.  
National Program Director  
Chemical Safety for Sustainability Research Program

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**From:** Pensak, Mindy <Pensak.Mindy@epa.gov>  
**Sent:** Friday, December 20, 2019 10:45 AM  
**To:** Frithsen, Jeff <Frithsen.Jeff@epa.gov>  
**Cc:** Tietge, Joe <Tietge.Joe@epa.gov>; Gillespie, Andrew <Gillespie.Andrew@epa.gov>; Iglesias, Ariel <Iglesias.Ariel@epa.gov>; Azzam, Nidal <Azzam.Nidal@epa.gov>; Williamson, Anahita <Williamson.Anahita@epa.gov>  
**Subject:** RE: ORD Advanced Notification: Manuscript: Washington et al., Nontargeted mas-spectral discovery of novel PFAS & their use to fingerprint legacy PFAS in New Jersey

Hi Jeff,

As per your request, attached please find EPA's comments and suggested text revisions on this draft manuscript and fact sheet. Please let us know if you have any questions regarding this review.

Anahita & Ariel, please let me know if John Prince (Region 2 SEMD DD) plans on providing comments as well.

Thank you and happy holidays to all,

Mindy Pensak

R2 Regional Science Liaison  
LSASD/DO  
732-321-6705 (Mon-Thur)  
908-764-0915 (Fri)



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**From:** Frithsen, Jeff <Frithsen.Jeff@epa.gov>  
**Sent:** Sunday, November 24, 2019 10:49 AM  
**To:** Morris, Jeff <Morris.Jeff@epa.gov>; Henry, Tala <Henry.Tala@epa.gov>; Stedeford, Todd <Stedeford.Todd@epa.gov>; Pensak, Mindy <Pensak.Mindy@epa.gov>  
**Cc:** Tietge, Joe <Tietge.Joe@epa.gov>; Fleming, Megan <Fleming.Megan@epa.gov>; Gillespie, Andrew <Gillespie.Andrew@epa.gov>; LaVay, Maggie <LaVay.Maggie@epa.gov>  
**Subject:** ORD Advanced Notification: Manuscript: Washington et al., Nontargeted mas-spectral discovery of novel PFAS & their use to fingerprint legacy PFAS in New Jersey

ORD is providing for advanced notification a recently developed manuscript. The manuscript is Washington et al., *Nontargeted mas-spectral discovery of novel PFAS & their use to fingerprint legacy PFAS in New Jersey*.

This advanced notification is being provided to OCSPP-OPPT and Region 2.

The goal of this advanced notification is to ensure there are no policy statements contained within the product or factual errors regarding programs and to avoid surprises of published data relevant to the activities of our program and regional partners.

We ask for your comments by COB Monday, December 9.

Please provide any comments you might have and let me know should you have any questions. Thanks in advance!

Jeff

Jeffrey B. Frithsen, Ph.D.  
National Program Director  
Chemical Safety for Sustainability Research Program  
Office of Research and Development (8101R)  
202-564-3512 (office phone)  
Ex. 5 Personal Privacy (PP) (cell phone)

**From:** "Gillespie, Andrew" <Gillespie.Andrew@epa.gov>  
**Date:** November 15, 2019 at 9:02:39 AM EST  
**To:** "Rodan, Bruce" <rodan.bruce@epa.gov>  
**Cc:** "Fleming, Megan" <Fleming.Megan@epa.gov>  
**Subject:** **ADVANCED NOTIFICATION - novel PFAS, fingerprinting, transport, New Jersey**

(resending revised manuscript following comments from Bruce)...

Hello Bruce – here is another PFAS manuscript from CEMM for advanced notification, using some of our recently generated data from New Jersey to identify some new PFAS congeners in soil samples as well as using those data for fingerprinting likely sources. Given the novel nature of the PFAS and their presence in soil, I suggest sharing with OCSPP and OLEM for advanced notification. We made OCSPP aware of the novel PFAS findings last year, when we first generated the data, so this should not be a surprise.

Text of fact sheet is below.

## Ex. 5 Deliberative Process (DP)

Please let me know if there are any questions, and thank you for your assistance.

Best regards, Andy

Transmittal Summary Document  
ORD Manuscript Review

1. Manuscript Title:  
Use of Nontargeted PFAS to Develop a Legacy PFAS Fingerprint in New Jersey

Authors: John W. Washington1\*, Charlita G. Rosal1, James P. McCord2, Mark J. Strynar2, Andrew B. Lindstrom2, Erica L. Bergman3, Sandra M. Goodrow3, Haile K. Tadesse2, Andrew N. Pilant2, Benjamin J. Washington4, Mary J. Davis1, Brittany G. Stuart5, Thomas M. Jenkins6

Affiliations: 1USEPA, Office Research and Development, Athens, GA.  
2USEPA, Office Research and Development, Research Triangle Park, NC.  
3NJDEP, Division of Science and Research, Trenton, NJ.  
4USEPA, Office Research and Development, Washington, DC.  
5USEPA, Office of Research and Development, Cincinnati, OH.  
6Senior Environmental Employment Program (USEPA/ORD), Athens, GA.

1. Background/Overview:

New Jersey Department of Environmental Protection (NJDEP) requested ORD's assistance to investigate legacy PFAS distribution in NJ, including two potential PFAS sources. NJDEP collected soil, vegetation and water samples from transects and from across much of the state, delivering soil/veg samples to Athens and water to RTP.

In this manuscript, we report on soil PFAS in New Jersey, not US water. In soil, we identified ten new PFAS compounds, chlor-perfluoro-polyether-carboxylates (CIPFPECAs), using nontargeted analyses and semiquantitated the concentrations of these compounds. We contoured these CIPFPECA values on a map, forming a pattern focusing on one of the potential sources identified by NJDEP.

We used the CIPFPECA data, and PFAS reaction stoichiometry, to develop a fingerprint of legacy PFAS. When this legacy fingerprint was contoured on a map, it formed a pattern focusing on both potential sources identified by NJDEP.

1. Relevancy to program office/regional research needs/priorities:

The data and information reported here suggest that fingerprinting of PFAS may be possible in certain situations to support risk managers in identifying sources of specific PFAS.

1. Name(s) of program/regional office coauthors or reviewer(s) of earlier drafts, if any

No program or regional coauthors or reviewers. Staff from NJ DEP are included as coauthors. Draft manuscript has been shared for awareness with R2 POC for the NJ collaboration.

1. Major observations and results:

Collectively, our results: (i) identify ten novel PFAS, CIPFPECAs, not previously detected in the environment, including congeners with no previous reports, so far as we know; (ii) suggest many CIPFPECA congeners have bioconcentration potential on the order of or greater than PFOA and PFOS; (iii) document the widespread distribution of CIPFPECAs over much of densely populated New Jersey; (iv) indicate the source of these CIPFPECAs in New Jersey dominantly are from Solvay; (v) were used to fingerprint historical sources of legacy long-chain PFCAs C11 and C13 being from Solvay, and C10 and C12 from the Chemours facility; and (vi) document discernable signals of these legacy PFCAs across an expansive breadth of south Jersey persisting today.

1. Potential implications of the findings:

These data and information: (i) are of interest to NJDEP staff; (ii) suggest a potential exposure of a large population to PFAS; and (iii) also suggest a potential for bioaccumulation.

1. Findings advancing existing scientific knowledge:

Advances in scientific knowledge include: (i) identification/elucidation of ten new PFAS congeners, potentially with isomers, in the environment; (ii) development of methods to detect these compounds on conventional LC/MS/MS; (iii) document sorting of PFAS in atmospheric plumes by molecular mass,

perhaps for the first time; (iv) document considerable atmospheric transport distances of PFAS having very low vapor pressures (i.e., chemically non-gaseous PFAS), contrary to expectations of many chemists (e.g., me); (v) reporting of semiquantitative concentrations of nontargeted analytes for the first time in the peer-reviewed literature so far as I know (I had reported semi-quantitated values for targeted compounds in the past but not nontargeted); (vi) perhaps reports one of the first fingerprints of legacy compounds in a complex contaminant setting – there's lots of literature noise about fingerprinting, but I have seen no real-world examples that aren't isolated sites in generally pristine surroundings or unique compounds.

1. Publication information (journal, book) and estimated timelines:

Optimistically, I hope to have this thru clearance by the end of November. When clearance is complete, I plan to submit to the journal Science. Realistically, I understand the strong chance of rejection by Science at which time I would rewrite for format and submit to ES&T.

Andrew J. R. Gillespie, Ph. D.  
Associate Director, US EPA/ORD/CEMM  
ORD Executive Lead for PFAS R&D

Office 919 541 3655 Cel Ex. 6 Personal Privacy (PP)